## CLAIMS

We claim as deserving the protection of Letters Patent:

1. A laser produced by the process of:

providing a structure comprising a substrate with an epi structure thereon comprising a gain region with multiple quantum wells, a mirror stack coupled to the gain region, and a conductive layer coupled to the mirror stack;

dividing the conductive layer into a conductive, central area and one or more dielectric, peripheral areas;

attaching a conductive plate to the conductive layer;

thinning the substrate to improve the passage of light therethrough to produce a substrate remnant; and

attaching an electrode to the substrate remnant;

whereby the conductive plate can act as a mechanical support for the structure, as an electrode, and as a means for dissipating heat.

2. The laser of claim 1 wherein the step of attaching an electrode to the substrate remnant comprises attaching an annular electrode.

3. The laser of claim 1 wherein the mirror stack comprises a distributed Bragg reflector.

4. The laser of claim 1 wherein the gain region with multiple quantum wells is formed with GaAs interleaved with AlGaAs barrier layers whereby the quantum wells are suitable for light with a wavelength of approximately 850 nm.

5. The laser of claim 1 wherein the gain region with multiple quantum wells is formed with AlGaAs alloy layers of varying percentages of Al whereby the quantum wells are suitable for light with a wavelength of approximately 780 nm.

6. The laser of claim 1 wherein the gain region with multiple quantum wells is formed with GaInP alloy with AlGaInP barrier layers whereby the quantum wells are suitable for light with a wavelength of approximately 670 nm.

7. The laser of claim 1 wherein the conductive layer coupled to the mirror stack is made with AlAs.

8. The laser of claim 1 wherein the step of dividing the conductive layer into the conductive, central area and one or more dielectric, peripheral areas is carried out by selective oxidation.

9. The laser of claim 1 wherein the conductive plate is attached to the conductive layer by conductive adhesive.

10. The laser of claim 9 wherein the conductive adhesive is solder and wherein the step of coupling the conductive plate to the conductive layer is carried out by heating the conductive adhesive, conductive plate, and conductive layer and maintaining the conductive adhesive, conductive plate, and conductive layer at an elevated temperature for a time sufficient to bond the conductive adhesive, conductive plate, and conductive layer together.

11. The laser of claim 1 wherein the conductive plate is approximately 1 mm in thickness.

12. The laser of claim 11 wherein the conductive plate is formed from metal.

13. The laser of claim 1 wherein the step of thinning the substrate to improve the passage of light therethrough to produce a substrate remnant is carried out by a Chemical and Mechanical Planarization (CMP) process.

14. The laser of claim 13 wherein the step of thinning the substrate comprises thinning the substrate to a thickness wherein it is substantially transparent to light emitted by the laser.

15. A laser produced by the process of:

providing a structure comprising a substrate with an epi structure thereon comprising an etch-stop layer, a mirror stack coupled to the etch-stop layer, and a gain region with multiple quantum wells coupled to the mirror stack;

depositing an electrode on the gain region;

attaching a support layer to the electrode;

thinning the substrate to improve the passage of light therethrough to produce a substrate remnant;

making a hole in the substrate remnant; and

depositing conductive material into the hole in the substrate remnant.

16. The laser of claim 15 wherein the process for producing the laser further comprises the step of attaching the substrate remnant to a circuit board.

17. The laser of claim 16 wherein the process for producing the laser further comprises the step of removing the support layer after the step of attaching the substrate remnant to the circuit board.

18. The laser of claim 15 wherein the etch-stop layer is formed by AlAs.

19. The laser of claim 15 wherein the support layer is formed from a polymeric material.

20. The laser of claim 15 wherein the step of thinning the substrate to improve the passage of light therethrough to produce a substrate remnant is carried out by a Chemical and Mechanical Planarization (CMP) process.

21. The laser of claim 15 wherein the step of thinning the substrate to improve the passage of light therethrough to produce a substrate remnant comprises thinning the substrate to a thickness of about 150 $\mu$m.

22. The laser of claim 15 wherein the step of depositing conductive material into the hole in the substrate remnant comprises depositing metal onto a bottom and side walls of the hole to provide ohmic contact and filling the hole with metal.

23. The laser of claim 22 wherein the hole is formed by a selective etching procedure.

24. A laser produced by the process of:

providing a structure comprising a substrate with an epi structure thereon comprising a mirror stack coupled to the substrate, and a gain region with multiple quantum wells coupled to the mirror stack;

removing the substrate;

replacing the substrate with a plate of semiconductor material;

depositing an electrode on the plate of semiconductor material;

depositing an electrode on the gain region.

25. The laser of claim 24 wherein the plate of semiconductor material comprises a plate of GaP whereby the plate of semiconductor material will not absorb light with a wavelength longer than 600 nm.

26. A laser produced by the process of:

providing a structure comprising a substrate with an epi structure thereon comprising a conductive layer coupled to the substrate, a mirror stack coupled to the conductive layer, and a gain region with multiple quantum wells coupled to the mirror stack;

securing a wafer of semiconductor material to the gain region of the structure;

thinning the substrate to produce a substrate remnant;

dividing the conductive layer into a conductive, central area and one or more dielectric, peripheral areas;

depositing an electrode on the substrate remnant; and

depositing an electrode on the wafer of semiconductor material.

27. The laser of claim 26 wherein the step of securing a wafer of semiconductor material to the gain region comprises applying pressure to force the wafer of semiconductor material and the gain region into contact and applying a sufficiently elevated temperature for a sufficient time to the wafer of semiconductor material and the gain region for fusing the wafer of semiconductor material and the gain region together.

28. The laser of claim 27 wherein the step of securing a wafer of semiconductor material to the gain region is carried out in a dry nitrogen atmosphere.

29. The laser of claim 26 wherein the step of thinning the substrate to produce a substrate remnant comprises thinning the substrate to a thickness of approximately 10 μm

30. The laser of claim 26 wherein the step of dividing the conductive layer into a conductive, central area and one or more dielectric, peripheral areas is carried out by selective oxidation.

31. The laser of claim 26 where the step of depositing an electrode on the wafer of semiconductor material comprises depositing an annular electrode.

32. The laser of claim 26 wherein the gain region is formed with InGaAsP quantum wells bonded to GaAs/AlGaAs distributed Bragg reflector layers.

33. A laser produced by the process of:

providing a structure comprising a substrate with an epi structure thereon comprising a release layer, a gain region with multiple quantum wells coupled to the release layer, a mirror stack coupled to the gain region, and a conductive layer coupled to the mirror stack;

dividing the conductive layer into a conductive, central area and one or more dielectric, peripheral areas;

affixing a support layer to the conductive layer;

removing the substrate and the release layer;

replacing the substrate with a replacement substrate;

removing the support layer;

depositing an electrode on the conductive layer; and

depositing an electrode on the replacement substrate.

34. The laser of claim 33 wherein the release layer comprises AlAs.

35. The laser of claim 33 wherein the support layer is formed from polymeric material.

36. The laser of claim 33 wherein the step of removing the substrate and the release layer comprises forming a channel between the substrate and the gain region.

37. The laser of claim 36 wherein the step of forming a channel between the substrate and the gain region comprises the application of a solvent to etch the release layer.

38. The laser of claim 33 wherein the step of depositing an electrode on the replacement substrate comprises depositing an annular electrode on the replacement substrate.

39. The laser of claim 33 wherein the step of affixing the support layer to the conductive layer is carried out by interposing adhesive between the support layer and the conductive layer and wherein the step of removing the support layer is carried out by the application of a solvent.